

Plant and Soil Science & Technology, Entry

Levels: Grades 9-12

Units of Credit: Year (1.0)

CIP Code: 020411

Prerequisite: None

COURSE DESCRIPTION

Students will be exposed to a wide range of scientific principles, such as genetics, disease, pests, and management practices. The scientific processes of observation, measurement, hypothesizing, data gathering, interpretation, analysis, and application are stressed. Career opportunities and educational preparation are examined. Learning activities are varied, with classroom, laboratory, and field experiences emphasized.

CORE STANDARDS, OBJECTIVES, AND INDICATORS

STANDARD

020411-01 Students will develop an understanding of the role of FFA in Agricultural Education Programs.

OBJECTIVES

- 020411-0101 Students will understand the history and organization of FFA.
- Students will explain how, when, and why the FFA was organized.
 - Students will explain the mission and strategies, colors, motto, parts of the emblem, and the organizational structure of the FFA.
 - Students will recite and explain the meaning of the FFA Creed.
 - Students will explain the purpose of a Program of Activities and its committee structure.
- 020411-0102 Students will discover opportunities in FFA.
- Students will describe how the FFA develops leadership skills, personal growth, and career success.
 - Students will identify major state and national activities available to FFA members.
- 020411-0103 Students will determine FFA degrees, awards, and CDEs.
- Students will explain the FFA degree areas.
 - Students will identify the FFA proficiency awards.
 - Students will explain various team and individual Career Development Events.

STANDARD

020411-02 Students will understand the benefits of a Supervised Agricultural Experience (SAE) Program.

OBJECTIVES

- 020411-0201 Students will determine the benefits of an SAE.
- Students will explain the importance of goals and career ladders.
 - Students will define supervised horticultural/agricultural experience.
 - Students will explain the benefits of supervised horticultural/agricultural experience programs.

- 020411-0202 Students will determine the kinds of SAE programs.
- Students will explain the difference between entrepreneurship and placement SAE's.
 - Students will describe research/experimentation and exploratory SAE's.
 - Students will explain the characteristics of a good SAE program and student responsibilities that are involved.
- 020411-0203 Students will research possible SAE programs.
- Students will identify career interest areas in agriculture.
 - Students will identify skills needed for career success.
 - Students will explain opportunities for SAE programs.
- 020411-0204 Students will plan an SAE program.
- Students will identify the steps in planning an SAE program.
 - Students will identify the parts of an annual SAE program plan.
 - Students will discuss the function of a training plan and/or agreement in an SAE program.
- 020411-0205 Students will implement SAE programs.
- Students will discuss the importance of keeping records on an SAE program.
 - Students will explain the types of financial records needed to support a chosen SAE program.
 - Students will identify standards to follow in keeping records on an SAE program.

STANDARD

020411-03 Students will understand the nature of plant science.

OBJECTIVES

- 020411-0301 Students will identify career opportunities and levels of education needed in the plant science area.
- Students will identify and describe the major areas of plant and soil science occupations.
 - Students will identify career and entrepreneurship opportunities and expectations in plant and soil science.
- 020411-0302 Students will demonstrate an understanding of the history of agriculture.
- Students will explain how the science of agriculture helped develop civilization.
 - Students will discuss advancements made through Agriscience.
- 020411-0303 Students will demonstrate an understanding of the importance of plant and soil science.
- Students will identify the various roles of plants in everyday life.
 - Students will identify the various segments of plant and soil science.
 - Students will identify important types of plants and explain their uses.

STANDARD**020411-04 Students will demonstrate an understanding of soil science.****OBJECTIVES****020411-0401** Students will explain the importance of soil.

- Students will explain the importance of soil as a life-supporting layer.
- Students will explain the importance of soil as a medium for plant growth.
- Students will describe the agricultural uses of soil.
- Students will describe the nonagricultural uses of soil.

020411-0402 Students will explain soil-forming factors.

- Students will identify five factors involved in soil formation.
- Students will describe different types of parent material.
- Students will explain topography and how it affects soil formation.
- Students will explain how organisms affect soil development.
- Students will describe how time and weathering affect properties of soil.
- Students will explain how climate affects the development of soil.

020411-0403 Students will describe basic biological, physical, and chemical properties of soil.

- Students will explain the contents of soil.
- Students will describe soil texture and structure.
- Students will describe the biological nature of soil.
- Students will describe the chemical properties of soil.

020411-0404 Students will analyze soil fertility.

- Students will describe the meaning and importance of soil fertility.
- Students will explain the role of organic matter, soil depth, surface slope, soil organisms, and nutrient balance in soil productivity.

STANDARD**020411-05 Students will demonstrate an understanding of plant structure and function.****OBJECTIVES****020411-0501** Students will demonstrate an understanding of cells and seeds, the basics and beginnings.

- Students will describe the cellular structure of plants.
- Students will explain the structure and kinds of seed.
- Students will describe the process of seed germination.
- Students will discuss the conditions required for seed germination.
- Students will explain the importance of seed quality.

020411-0502 Students will recognize roots and shoots.**020411-0503** Students will analyze inside the stem, roots and leaves.**020411-0504** Students will understand plant adaptations used for protection.

- Students will discuss plant responses to a shortage of water.
- Students will describe plant responses to temperature.

- 020411-0505 Students will explain the control of plant growth and development.
- Students will identify plant growth regulators (PGR) and their functions.
 - Students will explain plant tropisms.
 - Students will discuss synthetic growth regulators.
 - Students will describe commercial uses of plant growth regulators.

- 020411-0506 Students will describe the uptake and use of water, minerals, and light.
- Students will describe the functions of water in plant growth.
 - Students will explain the absorption and transport systems of plants.
 - Students will explain the role of light quality on plant growth.
 - Students will describe the effects of light quantity on plant growth.
 - Students will discuss the structural unit in which photosynthesis takes place.
 - Students will describe the processes of photosynthesis.
 - Students will identify factors that affect photosynthesis.

- 020411-0507 Students will explain plant reproduction.
- Students will identify the major parts of flowers and explain the functions of the parts.
 - Students will describe the types of flowers.
 - Students will explain the processes of pollination and fertilization.
 - Students will describe the purposes and kinds of fruit.
 - Students will explain the structure and kinds of seed.
 - Students will explain sexual reproduction, pollination, and fertilization in plants.
 - Students will explain asexual propagation in plants.
 - Students will describe methods for asexually propagating plants.

STANDARD

020411-06 Students will demonstrate an understanding of agronomy.

OBJECTIVES

- 020411-0601 Students will demonstrate skills relating to the interrelated human, scientific, and technological dimensions of crop production and the resources necessary for producing domesticated plants.
- Students will determine the environmental impacts of crop production.
 - Students will identify environmental and economic impacts from soil erosion.
 - Students will describe the use of irrigation in crop production.

- 020411-0602 Students will describe the planting, growth, and development of major crops.
- Students will describe the planting, growth, and development of field corn.
 - Students will describe the planting, growth, and development of wheat.
 - Students will describe the planting, growth, and development of oats.
 - Students will describe the planting, growth, and development of forage crops.
 - Students will describe the planting, growth, and development of specialty crops.
- 020411-0603 Students will determine the fertilization needs of crops.
- 020411-0604 Students will manage crop production for maximum profit efficiency.
- 020411-0605 Students will understand how to harvest and manage forages.
- 020411-0606 Students will explain the process of harvesting grain crops.
- 020411-0607 Students will determine proper storage of crops.